been no oscillation of sea level, but that the channels may have been excavated by glaciers to their present position below the sea surface"; and, although the author does not regard this possibility as of much weight, we may recall attention to the interesting suggestion (quoted in NATURE, July 7, p. 218) made by Mr. G. K. Gilbert, from his observations on Alaska, that glaciers, under certain conditions, may excavate beneath sea-level.

The continental shelf of the Norwegian coast is somewhat irregular, the depth of the edge below sea-level differing much between 80m. and 300m., and it is only at a few places that it is as deep as 360m. (200 fms.). The great valleys and fjords of the land are often continued as submarine valleys or fjords across the submerged continental shelf, and at some points they open out at its edge, forming distinct incisions in the continental slope; but they are not as a rule traceable beyond the 400 metres line, and seldom even so far.

The Norwegian submarine channel at the southern end of Norway is regarded as part of the bed of the ancient "Baltic River," which drained the Baltic basin and southern Scandinavian tracts. It is pointed out that Prof. Amund Helland attributed this channel to the erosion of the Scandinavian glacier during the Great Ice Age, and the author, while admitting the influence of that glacier, considers that the present relative depth is due to the adjacent areas having been to a great extent filled up with glacial drift.

After dealing briefly with the regions of the Færoës and Iceland, and with the continental shelves of Britain, France, and North America, the author summarises his views on the general subject of the origin of continental shelves. He discusses also various explanations that have been given.

Regarding the continental shelves as having been shaped prior to the submerged valleys, and considering the great extent of these shelves, and the improbability of regular and extended vertical movements of the lithosphere, the author in 1901 had concluded that they must be due to oscillations of the hydrosphere. He now considers that the general level of the sea must have remained near its present position, despite many oscillations of the land, during the later geological periods. The eroded parts of the continental shelves must have been developed when the shelves were near to sea-level, owing their features partly to conjoint action of subaërial erosion and marine denudation, partly to deposition of terrigenous waste, and even locally to organic agents.

Attention is directed to the extensive coast platforms that occur in part a little below sea-level and extend above it, evidencing small oscillations of the shore-line. The Norwegian coast platform has a surface formed chiefly by solid rocks, and the depressions in it are not filled up to any great extent by waste or glacial drift. This platform was in the author's opinion formed by marine denudation after the fjords and channels now traversing it were cut; but the sculpturing may have been facilitated by the clearing away of débris by glacial action. He believes that marine denudation is most potent when coasts are being slowly submerged; but that the Norwegian platform can hardly have been formed during one period of submergence. These platforms were formed in comparatively recent times, whereas the continental shelves were to a great extent developed during Pliocene and Pleistocene times.

With regard to the oscillations of the land, the author leaves the explanation in a somewhat vague state, observing in conclusion that

> "whatever the causes of the oscillations of the shore-line may have been, the above facts seem to prove that, after each disturbance in the relation between land and sea, the earth's crust has a remarkably strong tendency to return to a certain position of perfect equilibrium, which is probably determined by the buoyancy of the crust floating on the underlying magma."

H. B. W.

FOREST ENGINEERING.

A Manual of Forest Engineering for India. By C. G. Rogers. Vol. i., pp. xx+321, price 6*s*. Vol. ii., pp. xix+267, price 6*s*. Vol. iii., pp. xii+392, price 7*s*. 6*d*. (Calcutta: Office of the Superintendent of Government Printing, India.)

THE manual under notice was written by order of the Indian Government. The work covers the syllabus of the course of study at the Imperial Forest School of Dehra Dun, but, in addition to this, there is much useful information included, giving the book a wider scope than the necessarily limited one of a syllabus of systematic instruction. The manual has been divided into eight parts. The separate parts deal with the following subjects:—(1) building materials; (2) building construction; (3) road making; (4) bridges; (5) transport of timber; (6) wells; (7) construction of embankments and water channels, river training works; (8) demarcation of forests.

In part i. we have a vast amount of information of the most useful kind on such materials as stone, bricks, tiles, lime, and timber. The source, strength, durability, preparation, and preservation of those various materials have been fully dealt with, each under its own heading. The last section of this part is devoted to carpentry and joinery, which, although not coming strictly under the heading of building materials, fit very well into this place as the most convenient for reference. Part ii., which is devoted to building construction, includes much eminently sound and useful information concerning foundations, walls, arches, floors, stairs, roofs, &c. All the best authorities have been consulted, and no suggestion or recommendation has been made which cannot be easily and successfully put into practice by the forester with such materials as he may find ready to hand and most suitable for his purpose, situated as he often is in out-of-the-way parts of the world, where not only the advice of a specially trained engineer, but also manufactured building materials are unobtainable. These two part complete the first volume of the manual.

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Parts iii. and iv., which deal respectively with road making and bridges, form vol. ii.; here again the parts have been subdivided into sections. The various problems and practical operations are dealt with in a very explicit and satisfactory manner. In this volume, as well as in the others, many useful figures and illustrations are given which supplement and enhance the value of the text. Parts v. to viii. are included in the third and last volume of the manual. As the author points out, this volume deals with those subjects which are of special interest to the forest manager. In dealing with the transport of timber, the author has given a complete account of the different methods of transport by roads, slides, forest tramways, wire-rope ways, and water. Each method has its own particular advantage, according to circumstances, which vary from place to place, but, with this volume as a guide, the forester need have no difficulty in selecting the method best suited to his own local conditions.

As the title indicates, the manual is intended for the use of forest officers in India, to whom it cannot fail to be of the greatest service and value. Great care has been taken to make the work as accurate and up to date as possible, and with this end in view the author sent proofs of the different parts of the manual to the Inspector-General of Forests to the Government of India and all conservators of forests for circulation among such forest officers as they might select for the purpose of recording any suggestions which they had to make; hence before publication the book was subjected to a thorough, practical, and critical examination, which renders it a standard authority and trustworthy source of reference.

While not replacing any of the standard works on civil engineering, the manual fills a big gap in the literature, and it is written in such a way that even those who have not had a special training in engineering may understand and appreciate its use. This work merits, and will no doubt attain, a wide circulation outside India. As a work of reference it should be in the hands of all whose profession brings them in contact with such engineering operations as do not require the skill of a highly trained expert.

There is a marked absence of technical terms, and where the use of these is unavoidable the author takes good care to make their meaning thoroughly clear. The illustrations form a very valuable feature of the manual, and greatly increase its practical utility. In most cases a detailed description has been appended, so that each figure may be clearly understood without any further reference to the text. The majority of these illustrations were drawn specially for the manual, a fact which adds much to their value. For the few illustrations which have been borrowed from other sources ample acknowledgment is made.

It will thus be seen that the manual embraces a wide range of subjects, all of which are pretty intimately associated with forestry. The third volume is of special interest to the forest manager, while vols. i. and ii. cannot fail to be also of great utility and value to those concerned in agriculture, horticulture, and planting in all their branches.

It has been the endeavour of the author, as he informs us in the preface, to make the manual a book of reference for the practical man as well as a text-book for the use of students. With this end in view, the information given on each subject has been made as complete and compact in itself as possible, thus obviating the necessity of cross references. In adapting the work to serve this double purpose, the author has exhibited a great amount of skill in the selection, treatment, and arrangement of the information given under the various headings.

NATURAL HISTORY OF COMMON ANIMALS.

The Natural History of Some Common Animals. (Cambridge Biological Series.) By Oswald H. Latter. Pp. x + 331. (Cambridge: University Press.) Price 5*s.* net.

THIS is an excellent book, written by a man who is equally in his element whether he writes as an outdoor naturalist or as a laboratory student. This combination is by no means a common one, and it is just the combination that is wanted for a book of this kind.

The common animals chosen are earthworms and leeches, the crayfish, the cockroach and its allies, dragonflies, wasps, the fresh-water mussel, snails and slugs, frogs, toads and newts, and some common internal parasites of domestic animals. The treatment of the "earthworm" is first rate. Its structure is well described, and always as the structure of a live animal, the function of each part being never lost sight of. For instance, the use of the setæ in locomotion is made clear, and the simple experiment of putting the earthworm on a polished horizontal surface is suggested. The familiar phenomenon of earthworms appearing on the surface of the soil after heavy rain is explained, and, no less successfully, what is less familiar, their method of coping with bacteria.

The "crayfish" seems to be the least successful of the papers. Only twenty-two pages are allowed to it, and of these five and a half are devoted to a discussion of the function of the otocysts. There is no lack of interest in the five and a half pages, but much that has been omitted might have claimed precedence. There is little about the appendages, from the swimmerets to the eye-stalks—a field rich in interest to the evolutionist. When the work of the scaphognathite is described, a parenthetic explanation, not easy to understand without previous knowledge, of what the scaphognathite is has to be inserted.

With insects Mr. Latter is thoroughly at home. He has made a great many observations of his own, and he has read the literature of his subject, so that he is able to give the best of what has been discovered. The result of reading his account of the wasp and its mode of life is that one wishes to read more. He has much to say about its sting, its "homing" faculty, its parasites. He enters equally into the life of the fresh-water mussel and its young glochidia sticking to fish and trailing after them. In the maw of a fresh-water mussel were found, among other things, a number of rotifers, a very interesting fact, especially

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